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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/737,123	12/16/2003	Wei Fan	YOR920030457US1	5953

28211 7590 08/03/2006

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EXAMINER	
LE, MIRANDA	

ART UNIT	PAPER NUMBER
2167	

DATE MAILED: 08/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/737,123	FAN ET AL.	
	Examiner	Art Unit	
	Miranda Le	2167	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 December 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-35* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-35* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings were received on 08/03/04. These drawings are acceptable.

Claim Objections

2. Claim 10 is objected to because of the following informalities: Claim 10, line 1, "*form*" should be changed to "*from*". Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Venkayala et al. (US Pub. No 20030212679), in view of Rosen et al. (US Patent No. 6,513,025).

As to claims 1, 28, 35, Venkayala teaches a method of searching data in databases using an ensemble of models (i.e. seeds models, [0018]), said method comprising:

ordering models (i.e. scoring of models, [0017]) within said ensemble in order of prediction accuracy (i.e. Trained model 110 may also be evaluated and adjusted in order to improve the quality, i.e. prediction accuracy, of the model, [0019]), with the most accurate model being first in said order (i.e. a topmost category including a class value having a highest associated probability, [0010]), ([0008-0009, 0018, 0019, 0035]);

selecting a sub-ensemble of said models that meets a given level of confidence (i.e. how much confidence may be placed in the prediction, [0023], the selected class values are those meeting the selection criteria presented in prediction parameters, [0024]), wherein said sub-ensemble in said order prediction accuracy ([0010, 0035]); and

applying said sub-ensemble, in place of said ensemble, to an example to make a prediction (i.e. The selected class values, which are included in multi-category apply output, [0024]) ([0010, 0035]).

Venkayala teaches the step of forming sub-ensembles, wherein said sub-ensembles in said order of prediction accuracy (i.e. model apply, [0017]).

Venkayala does not expressly teach "models are joined together in said sub-ensemble". However, Rosen teaches "models are joined together in said sub-ensemble" (i.e. The most dependable classification model, that is the classification model associated with the dependability model indicating the highest dependability for the unlabeled example, is chosen to classify each unclassified example (col. 4, line 66 to col. 5, line 9).

It would have been obvious to one of ordinary skill of the art having the teaching of Venkayala and Rosen at the time the invention was made to modify the system of Venkayala to include wherein models are joined together in said sub-ensemble in said order of prediction

accuracy as taught by Rosen. One of ordinary skill in the art would be motivated to make this combination in order to select the most appropriate classification model, and the prediction of that classification model is then accepted in view of Rosen, as doing so would give the added benefit of coalescing the predictions of the base models by learning the relationships between those predictions and the correct prediction, identifying a specific classification model as the one responsible for producing a final prediction and to including a simple explanation of why the prediction was made, and revising the selected model as the models change over time as taught by Rosen (col. 2, lines 31-42).

As per claim 8, Venkayala teaches a method of searching data in databases using an ensemble of models (i.e. seeds models, [0018]), said method comprising:

ordering models (i.e. scoring of models, [0017]) within said ensemble in order of prediction accuracy (i.e. Trained model 110 may also be evaluated and adjusted in order to improve the quality, i.e. prediction accuracy, of the model, [0019]), with the most accurate model being first in said order (i.e. a topmost category including a class value having a highest associated probability, [0010]) ([0008-0009, 0018, 0019, 0035]);

selecting a sub-ensemble of said models that meets a given level of confidence (i.e. how much confidence may be placed in the prediction, [0023], the selected class values are those meeting the selection criteria presented in prediction parameters, [0024]), wherein said sub-ensemble in said order prediction accuracy, such that said sub-ensemble include only the most accurate models (i.e. a topmost category including a class value having a highest associated probability, [0010]) ([0008, 0009, 0035]); and

applying said sub-ensemble, in place of said ensemble, to an example to make a prediction (i.e. The selected class values, which are included in multi-category apply output, [0024]) ([0010, 0035]).

Venkayala teaches the step of forming sub-ensembles, wherein said sub-ensembles in said order of prediction accuracy (i.e. model apply, [0017]).

Venkayala does not expressly teach "models are joined together in said sub-ensemble".

However, Rosen teaches "models are joined together in said sub-ensemble" (i.e. The most dependable classification model, that is the classification model associated with the dependability model indicating the highest dependability for the unlabeled example, is chosen to classify each unclassified example (col. 4, line 66 to col. 5, line 9).

It would have been obvious to one of ordinary skill of the art having the teaching of Venkayala and Rosen at the time the invention was made to modify the system of Venkayala to include wherein models are joined together in said sub-ensemble in said order of prediction accuracy as taught by Rosen. One of ordinary skill in the art would be motivated to make this combination in order to select the most appropriate classification model, and the prediction of that classification model is then accepted in view of Rosen, as doing so would give the added benefit of coalescing the predictions of the base models by learning the relationships between those predictions and the correct prediction, identifying a specific classification model as the one responsible for producing a final prediction and to including a simple explanation of why the prediction was made, and revising the selected model as the models change over time as taught by Rosen (col. 2, lines 31-42).

As per claim 15, Venkayala teaches a method of searching data in databases using an ensemble of models (i.e. seeds models, [0018]), said method comprising:

performing training (i.e. training/model building, [0019]) comprising:

ordering models (i.e. scoring of models, [0017]) within said ensemble in order of prediction accuracy (i.e. Trained model 110 may also be evaluated and adjusted in order to improve the quality, i.e. prediction accuracy, of the model, [0019]), with the most accurate model being first in said order (i.e. a topmost category including a class value having a highest associated probability, [0010]) ([0008-0009, 0018, 0019, 0035]);

forming sub-ensembles (i.e. model apply, [0017]), wherein said sub-ensemble in said order of prediction accuracy ([0010, 0035]);

calculating confidence values of each of said sub-ensembles (i.e. to generate one or more scores for each row of data in scoring data. The scores for each row of data indicate how closely the row of data matches attributes of the model, how much confidence may be placed in the prediction, [0023]); and making a prediction comprising:

selecting a sub-ensemble of said models that meets a given level of confidence (i.e. The selected class values are those meeting the selection criteria presented in prediction parameters, [0024]) ([0010, 0035]); and

applying said sub-ensemble, in place of said ensemble, to an example to make a prediction (i.e. The selected class values, which are included in multi-category apply output, [0024]) ([0010, 0035]).

Venkayala teaches the step of forming sub-ensembles, wherein said sub-ensembles in said order of prediction accuracy (i.e. model apply, [0017]).

Venkayala does not expressly teach "joining different number of models together to form sub-ensembles".

However, Rosen teaches "joining different number of models together to form sub-ensembles" (i.e. The most dependable classification model, that is the classification model associated with the dependability model indicating the highest dependability for the unlabeled example, is chosen to classify each unclassified example (col. 4, line 66 to col. 5, line 9).

It would have been obvious to one of ordinary skill of the art having the teaching of Venkayala and Rosen at the time the invention was made to modify the system of Venkayala to include joining different numbers of models together to form sub-ensembles, wherein models are joined together in said sub-ensemble in said order of prediction accuracy as taught by Rosen. One of ordinary skill in the art would be motivated to make this combination in order to select the most appropriate classification model, and the prediction of that classification model is then accepted in view of Rosen, as doing so would give the added benefit of coalescing the predictions of the base models by learning the relationships between those predictions and the correct prediction, identifying a specific classification model as the one responsible for producing a final prediction and to including a simple explanation of why the prediction was made, and revising the selected model as the models change over time as taught by Rosen (col. 2, lines 31-42).

As per claim 21, Venkayala teaches a service of searching data in databases using an ensemble of models (i.e. seeds models, [0018]), said service comprising:

ordering models (i.e. scoring of models, [0017]) within said ensemble in order of prediction accuracy (i.e. Trained model 110 may also be evaluated and adjusted in order to improve the quality, i.e. prediction accuracy, of the model, [0019]), with the most accurate model being first in said order (i.e. a topmost category including a class value having a highest associated probability, [0010]) ([0008-0009, 0018, 0019, 0035]);

selecting a sub-ensemble of said models that meets a given level of confidence (i.e. how much confidence may be placed in the prediction, [0023], the selected class values are those meeting the selection criteria presented in prediction parameters, [0024]), wherein said sub-ensemble in said order prediction accuracy ([0010, 0035]); and

applying said sub-ensemble, in place of said ensemble, to an example to make a prediction (i.e. The selected class values, which are included in multi-category apply output, [0024]) ([0010, 0035]).

Venkayala teaches the step of forming sub-ensembles, wherein said sub-ensembles in said order of prediction accuracy (i.e. model apply, [0017]).

Venkayala does not expressly teach "models are joined together in said sub-ensemble".

However, Rosen teaches "models are joined together in said sub-ensemble" (i.e. The most dependable classification model, that is the classification model associated with the dependability model indicating the highest dependability for the unlabeled example, is chosen to classify each unclassified example (col. 4, line 66 to col. 5, line 9).

It would have been obvious to one of ordinary skill of the art having the teaching of Venkayala and Rosen at the time the invention was made to modify the system of Venkayala to include wherein models are joined together in said sub-ensemble in said order of prediction

accuracy as taught by Rosen. One of ordinary skill in the art would be motivated to make this combination in order to select the most appropriate classification model, and the prediction of that classification model is then accepted in view of Rosen, as doing so would give the added benefit of coalescing the predictions of the base models by learning the relationships between those predictions and the correct prediction, identifying a specific classification model as the one responsible for producing a final prediction and to including a simple explanation of why the prediction was made, and revising the selected model as the models change over time as taught by Rosen (col. 2, lines 31-42).

As to claims 2, 9, 16, 22, 29, Venkayala teaches said sub-ensemble includes fewer models than said ensemble (i.e. The selection criterion may comprise one of a topmost category including a class value having a highest associated probability, top N categories including N class values having highest associated probabilities, bottom N categories including N class values having lowest associated probabilities, or a set of select class values specified by the user and their associated probabilities and ranks, [0010]).

As to claims 3, 10, 17, 23, 30, Venkayala teaches said confidence is a measure of how closely results from said sub-ensemble will match results from said ensemble (i.e. The scores for each row of data indicate how closely the row of data matches attributes of the model, how much confidence may be placed in the prediction, how likely each output, [0049]).

As to claims 4, 11, 18, 24, 31, Venkayala teaches the size of each sub-ensemble is different and has a potentially different level of confidence (i.e. The selection criterion may comprise one of a topmost category including a class value having a highest associated probability, top N categories including N class values having highest associated probabilities, bottom N categories including N class values having lowest associated probabilities, or a set of select class values specified by the user and their associated probabilities and ranks, [0010]).

As to claims 5, 12, 19, 25, 32, Venkayala teaches the size of said ensemble is fixed (i.e. the selection criteria may include a limit on the number of class values that are to be selected, [0050]).

As to claims 6, 13, 20, 26, 33, Venkayala teaches as the level of confidence is raised, a sub-ensemble that has more models will be selected in said selecting process (i.e. The selection criteria may be defined by desired results data, [0024]), and as the level of confidence is lowered, a sub-ensemble that has fewer models will be selected in said selecting process (i.e. The selection criterion may comprise one of a topmost category including a class value having a highest associated probability, top N categories including N class values having highest associated probabilities, bottom N categories including N class values having lowest associated probabilities, or a set of select class values specified by the user and their associated probabilities and ranks, [0010]).

As to claims 7, 14, 27, 34, Venkayala teaches before said selecting, calculating confidence values of different sub-ensembles (i.e. to generate one or more scores for each row of data in scoring data. The scores for each row of data indicate how closely the row of data matches attributes of the model, how much confidence may be placed in the prediction, how likely each output, [0049]).

Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Miranda Le whose telephone number is (571) 272-4112. The examiner can normally be reached on Monday through Friday from 8:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R. Cottingham, can be reached on (571) 272-7079. The fax number to this Art Unit is 571-273-8300.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 305-3900.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Miranda Le
June 12, 2006